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TECHNICAL INTERESTS

Electrical and electronic failure analysis. Power electronics and electric machinery. Power supplies and instrumentation for welding and materials processing applications. Computer programming for engineering analysis and control systems. Measurement and signal processing in power electronic applications.

EDUCATION

- BS in Electrical Engineering, Northeastern University - 1976
- MS in Electrical Engineering, University of Connecticut - 1979
- Graduate Course 3.37 - Welding and Joining, MIT - 1994
- Instructor for Summer Course 3.70 - Welding Power Supplies, MIT - 1995

EMPLOYMENT SUMMARY

- Research Engineer: The Materials Science Welding Laboratory, MIT, Cambridge, Massachusetts
1995-present
- Project Manager: Simpson, Gumpertz & Heger, Arlington, Massachusetts
1994-1995
- Managing Engineer: Failure Analysis Associates, Westborough, Massachusetts
1991-1994
- Senior Engineer: Failure Analysis Associates, Westborough, Massachusetts
1988-1991
- Senior Engineer: Alexander Kusko, Inc., Needham Heights, Massachusetts
1979-1988

EXPERIENCE

Failure Analysis And Forensic Investigations

Aircraft Accident Investigation Handbook for Electronic Hardware prepared for Wright-Patterson AFB

Analysis of electrochemical failure in the flexible circuit connections of Ink-Jet printer cartridges.

Reverse engineering and analysis of microcomputer programs for profile cutting in electrical discharge machining equipment. (Patent Investigation).

Failure analysis and electrical damage mapping of electrical damage after the August 1990 outage of the Con-Edison Seaport Substation.

Measurement and characterization of the magnetization patterns in small brushless dc motors. (Patent Investigation).

Control Systems

Responsible for the design, implementation and testing of computer control algorithm for a 4 MW thyristor rectifier for transit vehicle testing. For the DOT/TTC, Pueblo, CO.

Design of 8088 based data acquisition and signal processing system for railroad track quality analysis.

Design review of Intel 8086 based propulsion logic and control system for BART C-car. Bay Area Rapid Transit Authority (BART), San Francisco, CA.

Design of phase locked loop control circuits for line synchronization of 60 Hz UPS.

Adaptation of Linear Quadratic Regulator for use with nonlinear control channel effects of the F100 jet engine. United Technologies Research Center, East Hartford, CT.

Power Electronics and Power Conversion

Designed and constructed water-cooled high performance power supplies for welding research. MIT, Cambridge, MA; DTNSRDC, Annapolis, MD. NIST, Boulder, CO.

Designed and constructed wideband power amplifiers using hybrid power op-amps for MHD stirring experiments. MIT, Cambridge, MA.

Designed the propulsion system for the Magneplane concept definition study for the National Maglev Initiative.

Performed a design review of control systems for emergency diesel generators at ten Nuclear Power Plants for Transamerica Delaval.

Conducted wideband measurement of DC-side harmonics on the BART 1000 V Traction Power System.

PROFESSIONAL AFFILIATIONS

- Registered Professional Engineer (Electrical): Massachusetts No. 32121
- Member, Institute of Electrical and Electronics Engineers
- Member, American Society for Materials
- Member, National Fire Protection Association

COMPUTER HARDWARE AND SOFTWARE

Over 15 years of experience in programming, engineering computation and hardware-related activities especially in real-time systems applications. Specific programming experience in C, FORTRAN, BASIC and an assortment of classical assembly languages (8088, Z80, PDP-11). C programmed embedded microcontroller applications.

PUBLICATIONS

1. "Energy Efficient Control of AC Induction Motor-Driven Vehicles", Proceedings of the 1980 IEEE/IAS Annual Meeting, Cincinnati, OH, October 1980.
2. "A Fast Response Transistor Current Regulator for Welding Research", Proceedings of the 1981 IEEE/IAS Annual Meeting, Philadelphia, PA, October 1981. (with J. Converti)
3. "Potential Use of Extended Speed Range AC Drives for Cranes and Hoists", Proceedings of the 1982 Control Engineering Conference, Chicago, IL, May 1982. (with A. Kusko)
4. "Survey of Microprocessors in Industrial Motor Drive Systems", Proceedings of the 1982 IEEE/IAS Annual Meeting, San Francisco, CA, October 1982. (with A. Kusko)
5. "Control Means for Minimization of Losses in AC and DC Motor Drives", IEEE Transactions on Industrial Application, July/August 1983. (with A. Kusko)
6. "Selecting Electric Motor Drives for the Chemical Processing Industries", Chemical Processing Magazine, September 1986. (with A. Kusko)
7. "McGraw Hill Standard Handbook for Electrical Engineers", 12th edition, Section 28 Industrial Electronics.
8. "The Shocking Truth of Accelerometer Selection", Machine Design Magazine, July 6, 1989 Issue. (with A. Booth)
9. "Maintenance of Power Electronic Equipment", Electrical Construction and Maintenance, October 1989. (with A. Kusko)
10. "Nonlinear Loading of Static and Rotating Uninterruptible Power Supplies (UPS)", International Power and Engineering Consultants Conference, Tokyo, Japan, April 1990 (with A. Kusko and S. M. Peeran)
11. "Output Impedance of PWM UPS Inverters - Feedback versus Filters", Proceedings, Institute of Electrical and Electronics - Industry Application Society Annual Meeting, Seattle, Washington, October 1990 (with A. Kusko and N. Medora)
12. "Causes of Aircraft Electrical Failures", National Aerospace Electronics Conference, Dayton, Ohio, May 20-24 1991 (with G. Slenski)
13. "Improved Rail-Fastener for Stray Current Control", Proceedings, American Society for Testing and Materials, Symposium on Corrosion Forms and Controls for Infrastructure, San Diego, California, November 1991 (with P. L. Todd)
14. "Aircraft Accident Investigation Handbook for Electronic Hardware", Proceedings of the 1992 Conference of the International Society of Air Safety Investigators, Dallas, Texas (with G. Slenski).
15. "Measurement of Permanent Magnet Rotor Magnetization Characteristics of DC Brushless Motors", Proceedings, Institute of Electrical and Electronics - Industry Application Society Annual Meeting, 1992 (with A. Kusko, N. Medora)
16. "Impact of Source Impedance on the Operation of Power Semiconductor Converters", May 4, 1993 Meeting of the IEEE Power Engineering Society, Boston Chapter. (with A. Kusko)
17. "The CRC Press Electrical Engineering Handbook", Section 61.2 - Motors. 1993, The CRC Press.
18. "Magnetic Fields from a Maglev Motor Winding", May 1993 Maglev Conference, Argonne National Laboratories. (with W. J. Greenberg)